

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application. Currently amended claims are shown with additions underlined and deletions in ~~strikethrough text~~ except double brackets may be placed before and after the deleted characters to show deletion of five or fewer characters.

1. – 26. (Cancelled)

27. (Currently Amended) A coreless linear motor comprising:

a fixed member functioning as a stator; and

a movable member functioning as an armature;

the fixed member having a yoke and first and second groups of permanent magnets fixed to the yoke;

the movable member having a coil assembly having an inner shape of a rectangle and a reinforcing member having an outer shape of a rectangle on which the coil assembly is fittingly mounted, the reinforcing member extending in a longitudinal direction of the linear motor and being made of a nonmagnetic and electrically conductive material;

the yoke having first and second facing yoke parts facing each other across a first distance and formed by magnetic material and a connection yoke part connecting first ends of the

first and second facing yoke parts to define a space through which the movable member is movable, the first, second and connection yokes being formed by magnetic material;

the first and second groups of permanent magnets being arranged so as to face the facing surfaces of the first and second facing yoke parts, each of the first and second groups of permanent magnets having different magnetic poles alternately arranged, along the longitudinal direction of the yoke, and the facing magnetic poles of the permanent magnets along the longitudinal direction of the yoke being the same;

the coil assembly having at least three coils, continuously arranged, functioning as three phase coils, and wound in a same direction having a hollow shape and rectangular or square outer shape, the nonmagnetic reinforcing member being fitted into the hollow shape, and arranged movably relative to [[said]] the first and second groups of permanent magnets along the longitudinal direction of [[said]] the yoke;

each coil being wound in a cylindrical form by a conductive metal wire;

the at least three coils being arranged in multiple layers, then fastened by a binder, the end surfaces of adjacent coils connected with each other via an electrical insulation member;

the coil assembly and reinforcing member moving in the space between the facing first and second groups of permanent magnets along the longitudinal directions of the yoke.

28. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 27 wherein in the cross-sectional shape of each coil, a length facing [[said]] the first and second groups of permanent magnets is longer than a length perpendicular to [[said]] the first and second groups of permanent magnets.

29. (Previously Amended) A coreless linear motor as set forth in claim 27, wherein in the cross-sectional shape of the reinforcing member, a length of a side facing the first and second groups of permanent magnets is longer than a length of a side perpendicular to the first and second groups of permanent magnets.

30. (Previously Presented) A coreless linear motor as set forth in claim 29, wherein a hole through which a cooling agent passes is formed inside the reinforcing member.

31. (Previously Amended) A coreless linear motor as set forth in claim 30, wherein heat radiating fins are formed in a hole inside the reinforcing member.

32. (Previously Amended) A coreless linear motor as set forth in claim 29, wherein the reinforcing member is produced by aluminum or an aluminum alloy.

33. (Previously Amended) A coreless linear motor as set forth in claim 29, wherein

the movable member is further provided with a holding member and spacers, and

the two ends of the reinforcing member inserted into the coil assembly are held by the holding member via the spacers.

34. (Previously Amended) A coreless linear motor as set forth in claim 33, wherein the reinforcing member and the spacers are formed by materials having a heat conductivity.

35. (Previously Amended) A coreless linear motor as set forth in claim 34, wherein the reinforcing member and the spacers are formed by aluminum or an aluminum alloy.

36. (Previously Amended) A coreless linear motor as set forth in claim 29, wherein the reinforcing member is arranged spaced from the surfaces of the first and second groups of permanent magnets by a distance whereby the density of the magnetic flux incident upon the surface of the reinforcing member becomes 1/2 or less of the magnetic flux density of the magnets at the center of the surfaces of the facing first and second groups of permanent magnets.

37. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 27, wherein the length of [[said]] the three coils in the longitudinal direction of [[said]] the yoke and the length of two adjoining magnets of [[said]] the first group of permanent magnets are equal.

38. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 27, wherein

[[said]] the coil assembly forming an armature has a first set of 3-phase coils and a second set of 3-phase coils generating magnetic fields of opposite phases, and the different phase coils corresponding to the first and second sets of 3-phase coils are arranged adjoining each other.

39. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 27, wherein

[[said]] the yoke has a square or rectangular cross-section and has first and second facing yoke parts formed by magnetic materials and third and third facing yoke parts perpendicularly intersecting [[said]] the first and second facing yoke parts and formed by magnetic materials;

[[said]] the groups of permanent magnets have

first and second groups of permanent magnets arranged facing facing surfaces of [[said]] the first and second facing yoke parts and

third and fourth groups of permanent magnets arranged facing facing surfaces of [[said]] the third and fourth facing yoke parts;

each of [[said]] the first and second groups of permanent magnets has a plurality of magnets along a longitudinal direction of [[said]] the yoke, in the plurality of magnets of [[said]] the first and second groups of permanent magnets, the poles of the magnets facing each other along the longitudinal direction of [[said]] the yoke being alternately different, and the poles of the permanent magnets along the longitudinal direction of [[said]] the yoke being the same; and

each of [[said]] the third and fourth groups of permanent magnets has a plurality of magnets along a longitudinal direction of [[said]] the yoke, in the plurality of magnets of [[said]] the third and fourth groups of permanent magnets, the poles of the magnets facing each other along the longitudinal direction of [[said]] the yoke being alternately different, and the

poles of the permanent magnets along the longitudinal direction of [[said]] the yoke being the same.

40. (Withdrawn-Currently Amended) A coreless linear motor comprising:
 - a fixed member; and
 - a movable member moving relatively with respect to the fixed member;
 - [[said]] the movable member having groups of permanent magnets arranged at [[said]] the yoke;
 - [[said]] the fixed member having a coil assembly;
 - [[said]] the yoke having first and second facing yoke parts facing each other across a first distance and formed by magnetic materials and a connection yoke part connecting first ends of [[said]] the first and second facing yoke parts;
 - [[said]] the groups of permanent magnets including first and second groups of permanent magnets arranged so as to face the facing surfaces of the first and second facing yoke parts, each of [[said]] the first and second groups of permanent magnets having a plurality of magnets along the longitudinal direction of the yoke, in the plurality of magnets of each of [[said]] the first and second groups of permanent magnets, the magnetic poles of magnets facing each other along the longitudinal direction of the yoke differing from each other, and the magnetic poles of the permanent magnets along the longitudinal direction of the yoke being the same;
 - [[said]] the coil assembly having at least three coils positioned between [[said]] the facing first and second groups of permanent magnets, [[said]] the at least three coils being

arranged and wound solidly in multiple layers, then fastened by a binder, the end surfaces of adjacent coils connected with each other via an electrical insulation member;

the fixed member further having a nonmagnetic and electrically conductive reinforcing member fit in solid parts of said coils,

the movable member having first and second groups of permanent magnets facing [[said]] the coil assembly and [[said]] the yoke moving along the longitudinal direction of [[said]] the coil assembly.

41. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 40, wherein in the cross-sectional shape of each coil, a length facing [[said]] the first and second groups of permanent magnets is longer than a length perpendicular to [[said]] the first and second groups of permanent magnets.

42. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 40, wherein

said fixed member further has a nonmagnetic reinforcing member fit in solid parts of said coils, and

in the cross-sectional shape of [[said]] the reinforcing member, a length of a side facing [[said]] the first and second groups of permanent magnets is longer than a length of a side perpendicular to [[said]] the first and second groups of permanent magnets.

43. (Withdrawn) A coreless linear motor as set forth in claim 42, wherein a hole through which a cooling agent passes is formed inside the reinforcing member.

44. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 43, wherein heat radiating fins are formed in a hole inside [[said]] the reinforcing member.

45. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 42, wherein [[said]] the reinforcing member is produced by aluminum or an aluminum alloy.

46. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 42, wherein

[[said]] the fixed member further comprises a holding member and spacers, and
the two ends of [[said]] the reinforcing member inserted into [[said]] the coil assembly are held by [[said]] the holding member via [[said]] the spacers.

47. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 46, wherein [[said]] the reinforcing member and [[said]] the spacers are formed by materials having a high heat conductivity and light weight.

48. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 48, wherein [[said]] the reinforcing member and [[said]] the spacers are formed by aluminum or an aluminum alloy.

49. (Withdrawn) A coreless linear motor as set forth in claim 42, wherein the reinforcing member is arranged spaced from the surfaces of the first and second groups of permanent magnets by exactly the distance whereby the density of the magnetic flux incident upon the surface of the reinforcing member becomes 1/2 or less of the magnetic flux density of the magnets at the center of the surfaces of the facing first and second groups of permanent magnets.

50. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 40, wherein the length of [[said]] the three coils in the longitudinal direction of [[said]] the yoke and the length of two adjoining magnets of [[said]] the first group of permanent magnets are equal.

51. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 40, wherein

[[said]] the coil assembly forming an armature has a first set of 3-phase coils and a second set of 3-phase coils generating magnetic fields of opposite phases, and

the different phase coils corresponding to the first and second sets of 3-phase coils are arranged adjoining each other.

52. (Withdrawn-Currently Amended) A coreless linear motor as set forth in claim 40, wherein

[[said]] the yoke has a square or rectangular cross-section and has first and second facing yoke parts formed by magnetic materials and third and third facing yoke parts

perpendicularly intersecting [[said]] the first and second facing yoke parts and formed by magnetic materials;

[[said]] the groups of permanent magnets have

first and second groups of permanent magnets arranged facing facing surfaces of [[said]] the first and second facing yoke parts, and

third and fourth groups of permanent magnets arranged facing facing surfaces of [[said]] the third and fourth facing yoke parts;

each of [[said]] the first and second groups of permanent magnets has a plurality of magnets along a longitudinal direction of [[said]] the yoke, in the plurality of magnets of [[said]] the first and second groups of permanent magnets, the poles of the magnets facing each other along the longitudinal direction of [[said]] the yoke being alternately different, and the poles of the permanent magnets along the longitudinal direction of [[said]] the yoke being the same; and

each of [[said]] the third and fourth groups of permanent magnets has a plurality of magnets along a longitudinal direction of [[said]] the yoke, in the plurality of magnets of [[said]] the third and fourth groups of permanent magnets, the poles of the magnets facing each other along the longitudinal direction of [[said]] the yoke being alternately different, and the poles of the permanent magnets along the longitudinal direction of [[said]] the yoke being the same.

53. (Previously Amended) A coreless linear motor as set forth in claim 27, wherein the at least three coils have square cross-sections.